National Institute of Environmental Health Sciences

Soil degradation and food security coupled with global climate change in northeastern China

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Abstract:

The northeastern China is an important commodity grain region in China, as well as a notable corn belt and major soybean producing area. It thus plays a significant role in the national food security system. However, large-scale land reclamation and non-optimum farming practices give rise to soil degradation in the region. This study analyzed the food security issues coupled with global climate change in the northeastern China during 1980-2000, which is the period of modern agriculture. The results of statistical data show that the arable land area shrank markedly in 1992, and then increased slowly, while food production generally continually increased. The stable grain yield was due to the increase of applied fertilizer and irrigated areas. Soil degradation in the northeastern China includes severe soil erosion, reduced soil nutrients, a thinner black soil layer, and deterioration of soil physical properties. The sustainable development of the northeastern China is influenced by natural-artificial binary disturbance factors which consist of meteorological conditions, climate changes, and terrain factors as well as soil physical and chemical properties. Interactions between the increasing temperature and decreasing precipitation in the region led to reduced accumulation of soil organic matter, which results in poor soil fertility. Human-induced factors, such as large-scale land reclamation and non-optimum farming practices, unsuitable cultivation systems, dredging, road building, illegal land occupation, and extensive use of fertilizers and pesticides, have led to increasingly severe soil erosion and destruction. Solutions to several problems of soil degradation in this region requiring urgent settlement are proposed. A need for clear and systematic recognition and recording of land use changes, land degradation, food production and climate change conditions is suggested, which would provide a reference for food security studies in the northeastern China.

Source: http://dx.doi.org/10.1007/s11769-013-0626-5

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Food/Water Quality, Food/Water Security

Food/Water Quality: Chemical

Food/Water Security: Food Access/Distribution

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: China

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Intervention: ☑

strategy to prepare for or reduce the impact of climate change on health

A focus of content

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

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